

# 昆 虫 学 报

KUNCHONG XUEBAO

第 59 卷 第 1 ~ 12 期

## 总 目 录

### 研究论文

#### ✧ 生理与生化

- 1 丝蛋白合成和分泌期家蚕丝腺中有氧氧化特性分析  
姚金美, 王启龙, 赵林川
- 8 光滑鳖甲抗菌肽的原核表达条件优化及其抗菌活性  
海力且木·艾力, 徐 鑫, 刘忠渊
- 16 家蝇 C-型凝集素的克隆与功能分析  
邢建晓, 刘艳娟, 路永鹏, 唐 婷, 柳峰松
- 25 中华蜜蜂信息素结合蛋白 OBP10 的基因克隆、原核表达和配基结合特性分析  
吴 帆, 黄君君, 谭 静, 唐明珠, 李红亮
- 33 烟青虫成虫脑结构解剖和三维模型构建  
陈秋燕, 吴 晓, 汤清波, 谢桂英, 赵新成
- 119 麦红吸浆虫幼虫不同滞育时期体内山梨醇含量及山梨醇脱氢酶基因表达水平变化  
刘 洋, 高 贺, 李雪娇, 仵均祥, 成卫宁, 朱克岩
- 127 高温对西花蓟马卵巢发育及卵黄蛋白含量的影响  
马亚斌, 孙丽娟, 李洪刚, 王思芳, 张 彬, 郑长英, 万方浩
- 138 胰凝乳蛋白酶抑制剂在蓖麻蚕主要组织中的分布及血液中的含量和活性  
赵 萍, 张 艳, 钟晓武, 王凌燕, 谭 祥, 董照明, 莫现会, 夏庆友
- 148 食物营养对黑腹果蝇肠道干细胞影响  
唐润东, 毛菲菲
- 156 意大利蝗存储蛋白 Hex2 基因的克隆与表达分析(英文)  
张晓红, 李艳丽, 张凯建, 侯 娟, 印 红
- 164 家蚕肽聚糖识别蛋白 L1 参与 Imd 信号通路  
张 杨, 刘 霁, 杨 杰, 崔清清, 沈中元, 吴金美
- 172 基于转录组的葱蝇表皮蛋白基因家族的鉴定及在非滞育和冬滞育条件下的表达析  
付丹影, 司风玲, 陈 斌, 徐燕玲, 郝友进
- 185 中华蜜蜂嗅觉受体 AcerOrco 的表达及定位分析  
张中印, 杨珊珊, 孟 娇, 赵慧婷, 姜玉锁
- 247 高桥氏果蝇表型频率变化和胁迫相关性状的表达: 季节性适应研究(英文)  
Seema RAMNIWAS, Babita KAJLA, Ravi PARKASH
- 260 暗黑鳃金龟气味结合蛋白 HparOBP15a 基因的克隆及功能分析  
房迟琴, 张鑫鑫, 刘丹丹, 李克斌, 张 帅, 曹雅忠, 樊 东, 尹 姣
- 269 肽聚糖识别蛋白 PGRP-SC 在家蝇肠道免疫中的功能分析  
路永鹏, 顾冀海, 高一夫, 唐 婷, 柳峰松, 黄大卫
- 278 一种可用于桔小实蝇表皮碳氢化合物分析的固体进样技术  
林 涛, 陈 婷, 何余容, 胡学难, 梁 帆, 雷妍圆, 吕利华

365 小菜蛾气味结合蛋白 OBP2 基因的克隆、表达谱及其结合特性分析  
程小娟, 蔡立君, 郑丽双, 覃江梅, 黄宇萍, 尤民生

377 家蚕蚕蛹过敏原 CPH30 的表达、纯化、免疫学鉴定及 B 细胞抗原表位预测  
胡 维, 梁志林, 王良录, 刘志刚

382 茶尺蠖水通道蛋白 EoAQP1 的 cDNA 克隆、多克隆抗体制备及亚细胞定位  
李良德, 王定锋, 刘丰静, 李慧玲, 张 辉, 吴光远

392 二化螟滞育生物钟蛋白 TIME-EA4 基因的克隆及时空和温度诱导表达分析  
鲁艳辉, 赵燕燕, 张发成, 郑许松, 朱平阳, 吕仲贤

402 葱蝇热激蛋白 DaHSP23 基因的克隆及在冬滞育和夏滞育蛹中的表达分析(英文)  
司凤玲, 何正波, 陈 斌

411 柑橘全爪螨热激蛋白基因 *PcHsp90* 的克隆及表达模式分析  
杨丽红, 豆 威, 蒋红波, 牛金志, 丁天波, 王进军

421 假眼小绿叶蝉微卫星位点的生物信息学分析  
李 倩, 陈学新, 韩宝瑜

427 松墨天牛化学感受组织荧光定量 PCR 内参基因的鉴定与筛选  
冯 波, 郭前爽, 毛必鹏, 杜永均

438 两种散白蚁两性生殖与孤雌生殖胚胎发育比较研究  
谈彦玲, 党玉蕾, 张宏贵, 郭晓慧, 严兴荣, 苏晓红, 邢连喜

446 绿盲蝽中枢神经系统的解剖结构  
谢桂英, 赵新成, 郭 培, 陈秋燕, 吴国良, 李国平, 封洪强

481 Gal80<sup>ts</sup> 与 Gal4 组合灵敏控制果蝇中 UAS 转基因的表达水平  
李开霞, 马恩波, 张建珍, 赵一丹, 张徐波

489 一个调控抗菌肽表达的小菜蛾肽聚糖识别蛋白 PxPGRP-SA  
郑志华, 许小霞, 余 静, 高延富, 张玉清, 欧阳莉娜, 金丰良

500 不同水平亮氨酸对繁殖期意大利蜜蜂蜂群群势及工蜂发育的影响  
戴荣国, 曹 兰, 王瑞生, 程 尚, 高丽娇, 罗文华, 任 勤, 姬聪慧, 谢 华, 刘佳霖

509 饥饿胁迫对褐纹金针虫生理特征的影响  
刘丹丹, 陈爱端, 李克斌, 尹 姣, 张 帅, 曹雅忠

516 意大利蝗不连续气体交换循环(DGC)呼吸周期历时对高温胁迫的响应  
王冬梅, 李 爽, 张永军, Roman JASHENKO, 季 荣

523 宽翅曲背蝗受精囊形态与超微结构观察(英文)  
李 柯, 杨宇菁, 毛 蕾, 张晋辉

581 准噶尔小胸螯甲短时低温胁迫响应的转录组分析  
库尔班·吐松, 陆雪莹, 刘小宁, 马 纪

592 绿盲蝽气味受体基因 *AlucOR40* 的克隆及功能研究  
张志翔, 张美萍, 王桂荣, 刘 杨

602 稻纵卷叶螟海藻糖酶基因的克隆、分子特性和表达分析  
田 宇, 杜 娟, 李尚伟, 李 娇, 王 爽

613 家蚕化学感受蛋白 CSP16 的表达及结合特性分析  
郭兴国, 陈 莹, 邢秋婷, 邢万静, 阙云超, 乔惠丽

622 中华按蚊 CPF 家族表皮蛋白基因的全基因组鉴定及其特征分析  
刘柏琦, 乔 梁, 许柏英, 郑学令, 陈 斌

699 白蛾周氏啮小蜂毒液对美国白蛾蛹血细胞免疫的影响  
辛 蓓, 张少斌, 刘佩旋, 郑雅楠

707 西花蓟马或二斑叶螨为害的菜豆对两者间后取食者体内保护酶和解毒酶活性的影响  
邝军锐, 田 甜, 温 娟, 刘 勇

716 禾谷缢管蚜阳离子通道基因 *RSC1* 的克隆、分子特性及诱导表达分析  
林芳菲, 左亚运, 赵 奇, 段辛乐, 李玉婷, 陈茂华

724 家蚕 miRNA Novel-31<sup>\*</sup> 上调溶血素基因的表达  
施莉莉, 耿 涛, 吴 萍, 潘中华, 覃光星, 高 坤, 侯成香, 郭锡杰

801 斜纹夜蛾酵母双杂交文库的构建及其在蜕皮激素受体互作蛋白筛选中的应用  
范琳芳, 何文婧, 苏智仁, 朱家明, 罗 威, 张 纯, 黄立华

812 小菜蛾触角结合蛋白 PxylOBP31 的鉴定与结合特性分析  
覃江梅, 蔡立君, 郑丽双, 程小娟, 尤民生

823 荔枝蒂蛀虫转录组及嗅觉相关基因分析  
孟 翔, 胡俊杰, 刘 慧, 欧阳革成, 郭明昉

831 茶尺蠖幼虫脑的解剖结构  
谢桂英, 陈俊华, 汤清波, 尹 健, 赵新成

917 变温对粘虫生殖及主要能源物质代谢的影响  
王 娟, 李伯辽, 仵均祥, 许向利

925 黑尾叶蝉卵黄原蛋白受体基因 cDNA 的克隆、序列分析及表达模式  
陈利鹏, 杜玉萍, 方 琦, 姚洪渭, 叶恭银

938 柞蚕蛹解除滞育过程中海藻糖合成酶基因的表达变化  
黄 伶, 孙良振, 王 勇, 汝玉涛, Muhammad IRFAN, 姜义仁, 石生林, 杨瑞生, 李喜升, 秦利

948 家蚕类泛素化翻译后修饰蛋白 NEDD8 的 cDNA 克隆、表达分析和亚细胞定位  
于 洁, 徐 莉, 沈中元, 唐旭东

1033 AChE 在水稻抗性诱导的褐飞虱凋亡中肠细胞中的定位及表达  
王斯奇, 陈 俊, 章娟娟, 杨之帆

1043 Bmo-miR-375-3p 对家蚕丝素蛋白轻链基因 *BmFib-L* 表达的调控作用  
范洋洋, 钱 平, 沈兴家, 王 欣, 蒋 涛, 唐顺明

1050 中华蜜蜂细胞色素 *CYP9E2* 基因克隆及其表达分析  
江武军, 何旭江, 王子龙, 颜伟玉, 曾志将, 吴小波

1058 中华按蚊全基因组微卫星的鉴定、特征及分布规律  
王小婷, 张玉娟, 何 秀, 梅 婷, 陈 斌

1069 蛋白酶抑制剂对梨小食心虫幼虫中肠蛋白酶活性的影响  
赵爱平, 孙 聪, 展恩玲, 仵均祥, 李怡萍

1079 中华蜜蜂工蜂咽下腺胚后发育过程中细胞的增殖和凋亡  
李兆英, 余红梅, 孙 艳, 孙 婧

1291 双委夜蛾不同虫态耐寒性及体内生化物质含量变化  
郭婷婷, 于志浩, 门兴元, 于毅, 郑长英, 孙廷林, 张思聪, 李丽莉

1298 高 CO<sub>2</sub> 浓度对两种色型豌豆蚜体内营养物质含量及消化酶活性的影响  
李润红, 刘长仲

1308 氟化物导致的家蚕生殖损伤及氧化应激反应  
唐文超, 肖媛媛, 杨成飞, 郭东东, 朱 勇

1317 家蚕翅原基细胞的凋亡和自噬分析  
刘学术, 胡启豪, 郑思春, 冯启理, 邓惠敏

1325 黑腹果蝇保幼激素反应区 (JHRR) 与核蛋白结合能力调控的分子机制  
何倩毓, 张原熙

1332 中华蜜蜂 SRP9 基因的克隆、序列分析及原核表达  
吴鹏杰, 金红岩, 徐 进, 武江利, 李雨时, 郭岳琴, 姚 军, 徐书法, 吴 杰

1340 小地老虎雌蛾触角及幼虫头部感受器扫描电镜观察  
向玉勇, 孔丹丹, 刘同先, 张世泽

❖ 病理

192 革兰氏阳性菌苏云金芽孢杆菌和革兰氏阴性菌大肠杆菌诱导的柞蚕蛹生理指标变化  
付盈盈, 马玉堃, 任淑文, 杨立军, 刘春光, 付海燕, 侯跃莹, 杨峰山

200 基于 16S rDNA 基因序列的泽兰实蝇幼虫肠道细菌多样性分析  
张 荣, 杨 璞, 朱家颖, 袁 远, 桂富荣, 高 熹, 吴国星

292 Bt 杀虫蛋白处理后二化螟幼虫中肠细菌群落的变化  
李 振, 韩兰芝, 刘玉娣, 侯茂林

456 小菜蛾幼虫肠道细菌桃色欧文氏菌的代谢表型组学分析(英文)  
李文红, 金道超, 李凤良, 金剑雪, 程 英

464 温度通过影响 *Wolbachia* 滴度调控赤眼蜂生殖方式  
陈 茜, 王丽艳, 杨志强, 赵长江, 贺 琳, 张海燕

530 产气荚膜梭菌促进黑腹果蝇的生长和发育  
刘 威, 李玉娟, 刘晓梁, 卓 萍, 姚 红

632 日本弓背蚁肠道细菌群落季节特征(英文)  
徐 阳, 南小宁, 魏 琮, 贺 虹

956 玫烟色棒束孢诱导的小菜蛾免疫响应表达谱分析  
雷妍圆, 何余容, 谢梅琼, 吕利华, 顾家睿

965 稻纵卷叶螟肠道细菌群落结构与多样性分析  
刘小改, 杨亚军, 廖秋菊, 徐红星, 刘映红, 吕仲贤

1086 白蜡虫蜡花微生物多样性分析  
王雪庆, 于淑惠, 孙 涛, 赵遵岭, 陈晓鸣, 杨 璞

❖ 毒理与抗性

47 迷迭香油和花椒油对朱砂叶螨的生物活性  
程作慧, 刘耀华, 马新耀, 宋兵泽, 李 锐, 李生才

301 栗精碱对棉铃虫中肠组织可溶型海藻糖酶的抑制效应  
于彩虹, 艾 东, 梁晓贺, 王振波, 郭建军, 姜 辉, 林荣华

538 黄荆提取物对棉蚜的生物活性  
蒋恩顺, 朱 毅, 王江勇

641 三种植物精油对家蝇成虫的熏蒸活性  
张俊天, 熊国红, 何建国, 徐 颖, 魏丽秀, 彭映辉

732 香芹酮和薄荷醇手性异构体对淡色库蚊熏蒸及驱避活性  
付磊磊, 李双阳, 何 军, 马志卿, 张 兴

839 黄皮种子提取物对斜纹夜蛾幼虫的杀虫活性及有效成分鉴定  
郭成林, 覃柳燕, 万树青, 马跃峰, 覃建林, 马永林

977 棉铃虫中肠钙粘蛋白、氨肽酶 N 及碱性磷酸酯酶的抗血清对 Cry1Ac 和 Cry2Aa 毒力的影响  
王冰洁, 袁向东, 赵 曼, 刘 臣, 陈 琳, 梁革梅

1093 苦瓜素 I 和苦瓜苷 B 对亚洲玉米螟 Ofh 细胞的增殖抑制和致坏死作用  
罗剑峰, 刘 欢, 郭子俊, 王国才, 凌 冰

1151 常用杀虫剂对麦长管蚜和禾谷缢管蚜羧酸酯酶活性的抑制及对高效氯氰菊酯的增效作用  
鲁艳辉, 高希武

1159 增效醚对二化螟幼虫 7-乙氧基香豆素-O-脱乙酰酶和羧酸酯酶活性的影响  
李 阳, 史雪岩, 高希武

1166 烟粉虱不同发育阶段解毒代谢酶基因的特异性表达  
杨妮娜, 张友军, 杨 鑫, 黄大野, 龙 同, 万 鹏

1174 绿盲蝽毒死蜱抗性和敏感品系乙酰胆碱酯酶-2 基因的克隆、序列分析及表达水平  
左恺然, 康熙奎, 杨亦桦, 吴益东, 武淑文

1182 低剂量多杀菌素继代处理对小菜蛾 nAChR 基因表达的影响  
尹显慧, 吴青君, 张友军, 龙友华, 吴小毛, 李荣玉, 李 明, 赵赞伟, 王 英

1189 橘小实蝇 nAChR  $\alpha 9$  亚基基因的鉴定及其时空表达  
袁国瑞, 杨文佳, 许抗抗, 王进军

1199 二斑叶螨田间种群对阿维菌素的抗性及相关基因表达分析  
刘贻聪, 王 玲, 张友军, 谢 文, 吴青君, 王少丽

1206 小麦蚜虫对六种杀虫剂的抗药性及田间药效评价  
于晓庆, 张 帅, 宋姝娥, 朱庆荣, 谢传峰, 嵇 俭, 高希武

1213 湖北稻区白背飞虱田间种群抗药性监测  
张小磊, 廖 逊, 毛凯凯, 李建洪, 万 虎

1222 湖北稻区褐飞虱田间种群对常用杀虫剂抗药性监测  
张小磊, 廖 逊, 毛凯凯, 万 虎, 卢 鹏, 李建洪

1232 贵州稻区褐飞虱种群对六种杀虫剂的抗性动态  
李荣玉, 李 明, 吴小毛, 胡安龙, 杨 帆, 徐雪凌, 韩晶波, 胡贤锋, 尹显慧

1238 华北棉区主要害虫抗药性监测与治理技术示范  
张 帅, 马 艳, 闵 红, 于晓庆, 李 娜, 芮昌辉, 高希武

1246 我国棉花主产区棉蚜对吡虫啉的抗性监测及抗性机理  
崔 丽, 张 靖, 齐浩亮, 王芹芹, 陆宴辉, 芮昌辉

1254 斜纹夜蛾抗药性监测及茚虫威对其解毒代谢酶的影响  
刘 佳, 周 勇, 朱 航, 马海昊, 邓希乐, 周小毛, 柏连阳

1263 氮肥促进 Bt 水稻和非 Bt 水稻上溴氰菊酯诱导的褐飞虱再猖獗能力  
杨亚军, 李向冬, 徐红星, 郑许松, 吕仲贤

✧ 生态与害虫治理

55 UV-B 与重金属 Cd 双重胁迫对麦长管蚜种群生长发育和繁殖的影响  
王 萍, 杜一民, 杨 杰, 车文艳, 高欢欢, 赵惠燕, 胡祖庆, 胡想顺

64 温度和光周期对两种瓢虫捕食习性和发育的影响(英文)  
OMKAR, Bhupendra KUMAR

209 成虫体型大小驱动六斑月瓢虫性间相互选择(英文)  
Ankita DUKEY, OMKAR, Geetanjali MISHRA

219 似土维螨对西洋参根的取食量及其繁殖潜能  
赵利敏, 陈 浩

227 紫外线阻断膜防控茄子害虫效果及对植株生长和果实品质的影响  
朱 亮, 王泽华, 宫亚军, 任忠虎, 金桂华, 陈金翠, 魏书军

239 小叶黑面神与小叶头细蛾互惠共生系统的种群调控机制(英文)  
张 晶, 尹彦如, 王志博, 张振国, 胡冰冰, 石福臣, 李后魂

309 温度对栎黄枯叶蛾生长发育及繁殖的影响  
刘永华, 阎雄飞, 温冬梅, 陆鹏飞, 宗世祥, 骆有庆

316 寄主体型大小对管氏肿腿蜂生殖潜力的影响  
周冰颖, 李保平, 林芳芳, 孟 玲

322 斑痣悬茧蜂在粘虫寄主体内与中红侧沟茧蜂竞争下的存活和发育表现  
徐宇航,周金成,李保平,孟 玲

328 二斑叶螨对不同品种茄子的选择性与适合度  
金桂华,宫亚军,潜宗伟,朱 亮,王泽华,陈金翠,魏书军

546 不同波长 LED 光源对韭菜迟眼蕈蚊生殖行为的影响  
李 娜,范 凡,韩 慧,裴晓亚,刘 顺,魏国树

552 室内条件下莱氏猛叩甲对松墨天牛和黄粉虫的捕食能力  
辛玉翠,张龙娃,方 竹,刘柱东

560 有益真绥螨与巴氏新小绥螨的集团内捕食和同类相残作用  
郭建晗,孟瑞霞,张东旭,尹云飞,贾永红,刘文明

647 温度对微小花蝽生长发育和繁殖的影响  
丁 尧,杨群芳,李 庆,蒋春先,王海建

654 不同温度下斜纹夜蛾的两性生命表  
郝 强,黄 倩,梁炜博,贡常委,王学贵

663 昆虫种群生命表简化记录方法:以烟粉虱数据为例  
郑晓敏,齐 心,褚 栋

669 三室算盘子寄主上弯头细蛾的生物学特性及花气味成分分析  
张振国,滕开建,李后魂

739 温度对菜豆象发育和繁殖的影响  
姚 洁,戴仁怀,代传勇,杨 洪

846 不同施钾水平对苜蓿营养物质及抗蓟马性的影响  
张晓燕,师尚礼,李小龙,李亚娟,胡桂馨

854 绿盲蝽为害对枣树叶片光合作用及叶绿素荧光特性的影响  
李庆亮,谭 伟,李 捷,李夏鸣,黄军保,庞传明,赵龙龙

865 温度对双委夜蛾实验种群生长发育及繁殖的影响  
郭婷婷,门兴元,于 毅,陈 浩,周仙红,庄乾营,王振营,李丽莉

985 梨小食心虫蛹重对成虫繁殖力和寿命及下一代幼虫发育的影响  
庾 琴,王 芳,张润祥,郭贵明,范仁俊,郝 赤

991 幼虫期短时高温暴露对二点委夜蛾存活和繁殖的影响  
梁菲菲,王振营,何康来,张天涛,白树雄

997 茉莉酸诱导桑枝对桑天牛卵啮小蜂的引诱作用及桑枝挥发物组分分析  
王 薇,李继泉,王树香,张 静,董 欣,唐 哲,田红雨

1103 光周期变化对毛健夜蛾交配和产卵的影响  
邱小芳,谢建坤,吴丽萍,喻 琴,张萌萌,王光耀,徐韶晖,涂小云

1115 茄二十八星瓢虫成虫天花板爬行行为研究  
华登科,桂连友,Gilles BOITEAU,罗 杰

1123 湖南益阳小果油茶林小果油茶、油茶象和啮齿动物的相互作用  
李志文,孙寒松

1348 丁香酸可增强 LdNPV 对舞毒蛾致死及亚致死作用  
张波波,邵东华,冯淑军,策仁尼玛,段立清

1354 臭氧水对韭蛆防治效果及韭菜种籽发芽生长的影响  
史彩华,胡静荣,徐越强,杨玉婷,程佳旭,张友军

1363 极端气候成为我国草地螟暴发周期终结的重要因子  
陈 晓,姜玉英,孟正平,陈 阔,康爱国,李春民,翟保平

1376 利用基于光学暗场反射测量的光学遥感技术探测飞行的农业害虫(英文)  
朱世明, 李逸云, 高丽娜, 李天祺, 赵光宇, Svanberg SUNE, 路朝晖, 胡建东, 黄建荣, 封洪强

✧ 进化与系统学

77 基于线粒体 *COI* 和 *Cytb* 基因的中国灰蝶三亚科主要类群间的系统发育关系分析  
夏雪琴, 陈 晓, 夏琛琛, 石庆会, 郝家胜

85 新疆四种优势种革蜚超微结构观察  
吴 辉, 斯 清, 朱玉涛, 宋瑞其, 巴音查汗

337 秦巴山区中华蜜蜂种群微卫星 DNA 遗传分析  
郭慧萍, 周姝婧, 朱翔杰, 徐新建, 于瀛龙, 杨凯杰, 陈道印, 周冰峰

346 内蒙古阿拉善骆驼生活环境水生双翅目昆虫种类调查  
于志超, 邵国玉, 杨 波, 张 伟, 李 斌, 王 瑞, 杨莲茹, 杨晓野

747 DNA 条形码技术对重大潜在入侵害虫大洋臀纹粉蚧的鉴定有效性研究  
王玉生, 周 培, 田 虎, 万方浩, 张桂芬

871 蛻螂后胸叉骨的几何形态学分析及其适应进化研究  
佟一杰, 杨海东, 马德英, 白 明

880 基于 *COI* 和 *EF-1 $\alpha$*  基因的绢粉蝶属和妹粉蝶属系统发育关系分析  
丁昌萍, 张雅林

888 DNA 条形码试剂盒检测技术在大小蠹属种类鉴定中的应用  
安榆林, 杨晓军, 叶兼菱, 钱 路, 徐 梅, 吴耘珂

1004 长蝓蛉幼期形态附生物学记述  
姜 碌, 花保祯

1013 缅甸琥珀内含物形态结构在 X 射线下的可辨识性  
郭明霞, 杨海东, 黎 刚, 佟一杰, 李 莎, 路园园, 石爱民, 王 博, 张巍巍, 白 明

1133 大双角蝓蛉幼虫复眼超微结构及其在全变态类幼虫侧单眼演化中的意义  
陈庆霄, 花保祯

1386 重庆中华蜜蜂的形态和遗传多样性  
谷 瑛, 宾先丽, 刘 璐, 周 俊, 马振刚, 谭宏伟, 周泽扬, 许金山

综 述

93 昆虫体细胞遗传性别决定信号通路的研究进展  
段建平, 孟现鑫, 李 莹, 姚伦广, 阙云超, 夏庆友

102 果蝇衰老的调控机制  
张春红, 张敏菁, 焦文娟, 朱晴子, 祝增荣

353 昆虫钟基因研究进展  
任 爽, 魏慧敏, 郝友进, 陈 斌

472 昆虫与寄主植物营养关系的 DNA 分子追踪  
王 倩, 包伟方, 曾 娟, 杨益众, 陆宴辉

682 昆虫 RNA 干扰中双链 RNA 的转运方式  
刘吉升, 朱文辉, 廖文丽, 卜晓玲, 江婉仪

759 家蚕神经肽及其受体的功能和信号转导机制研究进展  
李晓童, 时连根

767 RAD-seq 技术及其在昆虫学研究中的应用  
魏书军, 李冰艳, 曹利军, 朱家颖

775 狄斯瓦螨和蜜蜂残翅病毒对蜜蜂健康的协同影响  
蔺哲广, 秦 瑶, 李 利, 王 帅, 郑火青, 胡福良

896 昆虫学的基本科学问题及分子生物学技术  
赵小凡

906 昆虫糖脂代谢研究进展  
魏 琪, 苏建亚

1021 臭虫的再猖獗、生物学及防治研究进展  
王 磊, 王常禄, 许益鏊, 曾 玲

1143 大头金蝇的综合利用研究进展  
王小云, 李 逵, 朱 芬, 雷朝亮

1272 长链非编码 RNA(lncRNA) 及其在昆虫学研究中的进展  
朱 斌, 梁 沛, 高希武

简 报

111 美国白蛾高毒力球孢白僵菌菌株筛选  
张龙娃, 康 克, 刘玉军, 张 晶, 孙 龙, 詹 成, 黄长春, 蒋丽雅, 叶开云, 丁德贵

568 绿原酸提高舞毒蛾核型多角体病毒(LdNPV)的致病力  
刘海晶, 段立清, 李海平, 冯淑军, 张波波

573 北京地区油松潜在重要害虫松黑木吉丁的形态和生物学特性观察  
曹亮明, 王小艺, 张永安

692 应用 PCR 技术快速检测熊蜂短膜虫  
张体银, 刘 蓓, 郑 腾, 白泉阳, 田国宁, 王武军, 张志灯, 于师宇

785 田间条件下甘蔗品种对蛀茎夜蛾的抗性评价(英文)  
Amin NIKPAY

791 肚倍蚜瘿内种群动态与虫瘿生长发育的关系  
查玉平, 杨子祥, 陈京元, 蔡三山

797 麦红吸浆虫成虫对线偏振光的趋性  
蒋月丽, 李 彤, 巩中军, 段 云, 苗 进, 武予清

1282 海南省冬季瓜菜农药使用现状调查与分析  
林殊凤, 吉训聪, 潘 飞, 梁延坡, 肖彤斌, 谢圣华

1395 注射 dsRNA 对飞蝗 *Knickkopf* 基因在 mRNA 和蛋白水平的沉默效率  
于荣荣, 丁国伟, 杨美玲, 马恩波, 张建珍

RESEARCH PAPERS

❖ **Physiology and Biochemistry**

- 1 Characterization of aerobic oxidation in the silk gland of the silkworm (*Bombyx mori*) during the synthesis and secretion of silk proteins  
YAO Jin-Mei, WANG Qi-Long, ZHAO Lin-Chuan
- 8 Optimization of prokaryotic expression conditions and the antibacterial activity of a novel antimicrobial peptide from *Anatolica polita borealis* (Coleoptera: Tenebrionidae)  
HAILIQIEMU AiLi, XU Xin, LIU Zhong-Yuan
- 16 Cloning and functional analysis of C-type lectin from *Musca domestica* (Diptera: Muscidae)  
XING Jian-Xiao, LIU Yan-Juan, LU Yong-Peng, TANG Ting, LIU Feng-Song
- 25 Molecular cloning, prokaryotic expression and ligand-binding characterization of a novel pheromone binding protein OBP10 in *Apis cerana cerana* (Hymenoptera: Apidae)  
WU Fan, HUANG Jun-Jun, TAN Jing, TANG Ming-Zhu, LI Hong-Liang
- 33 Anatomical organization and three-dimensional reconstruction of the brain in adult *Helicoverpa assulta* (Lepidoptera: Noctuidae)  
CHEN Qiu-Yan, WU Xiao, TANG Qing-Bo, XIE Gui-Ying, ZHAO Xin-Cheng
- 119 Changes in sorbitol content and the expression level of sorbitol dehydrogenase gene in *Sitodiplosis mosellana* (Diptera: Cecidomyiidae) larvae at different diapause stages  
LIU Yang, GAO He, LI Xue-Jiao, WU Jun-Xiang, CHENG Wei-Ning, ZHU Ke-Yan
- 127 Effects of high temperature on ovary development and yolk protein content of *Frankliniella occidentalis* (Thysanoptera: Thripidae)  
MA Ya-Bin, SUN Li-Juan, LI Hong-Gang, WANG Si-Fang, ZHANG Bin, ZHENG Chang-Ying, WAN Fang-Hao
- 138 Distribution of chymotrypsin inhibitors in major tissues and their content and activity in the hemolymph of the Eri-silkworm, *Samia cynthia ricini* (Lepidoptera: Saturniidae)  
ZHAO Ping, ZHANG Yan, ZHONG Xiao-Wu, WANG Ling-Yan, TAN Xiang, DONG Zhao-Ming, MO Xian-Hui, XIA Qing-You
- 148 Effects of food nutrients on the midgut stem cells of *Drosophila melanogaster*  
TANG Run-Dong, MAO Fei-Fei
- 156 Cloning and expression analysis of the hexamerin subunit type 2 (Hex2) gene from the grasshopper *Calliptamus italicus* (Orthoptera: Catantopidae) (*In English*)  
ZHANG Xiao-Hong, LI Yan-Li, ZHANG Kai-Jian, HOU Juan, YIN Hong
- 164 Peptidoglycan recognition protein L1 is involved in the Imd pathway in the silkworm, *Bombyx mori*  
ZHANG Yang, LIU Ji, YANG Jie, CUI Qing-Qing, SHEN Zhong-Yuan, WU Jin-Mei
- 172 Transcriptome-guided identification of the cuticular protein gene family of *Delia antiqua* (Diptera: Anthomyiidae) and expression analysis under non- and winter diapause conditions  
FU Dan-Ying, SI Feng-Ling, CHEN Bin, XU Yan-Ling, HAO You-Jin
- 185 Expression and localization analysis of olfactory receptor AcerOrco in the Chinese honeybee, *Apis cerana cerana* (Hymenoptera: Apidae)  
ZHANG Zhong-Yin, YANG Shan-Shan, MENG Jiao, ZHAO Hui-Ting, JIANG Yu-Suo
- 247 Changes in phenotypic frequencies and the analysis of stress related traits of *Drosophila takahashii*: a study of seasonal acclimation (*In English*)  
Seema RAMNIWAS, Babita KAJLA, Ravi PARKASH
- 260 Cloning and functional analysis of an odorant-binding protein HparOBP15a gene from *Holotrichia parallela* (Coleoptera: Melolonthidae)  
FANG Chi-Qin, ZHANG Xin-Xin, LIU Dan-Dan, LI Ke-Bin, ZHANG Shuai, CAO Ya-Zhong, FAN Dong, YIN Jiao

- 269 Functional analysis of peptidoglycan recognition protein PGRP-SC in intestinal immunity of *Musca domestica*  
LU Yong-Peng, GU Ji-Hai, GAO Yi-Fu, TANG Ting, LIU Feng-Song, HUANG Da-Wei
- 278 A solid injection technique usable for cuticular hydrocarbons analysis of *Bactrocera dorsalis* (Diptera: Tephritidae)  
LIN Tao, CHEN Ting, HE Yu-Rong, HU Xue-Nan, LIANG Fan, LEI Yan-Yuan, LU Li-Hua
- 365 Cloning, expression profiling and binding characterization of the OBP2 gene in the diamondback moth, *Plutella xylostella* (Lepidoptera: Plutellidae)  
CHENG Xiao-Juan, CAI Li-Jun, ZHENG Li-Shuang, QIN Jiang-Mei, HUANG Yu-Ping, YOU Min-Sheng
- 377 Expression, purification, immunological identification and B cell epitope analysis of allergen CPH30 in silkworm (*Bombyx mori*) pupae  
HU Wei, LIANG Zhi-Ling, WANG Liang-Lu, LIU Zhi-Gang
- 382 cDNA cloning, preparation of polyclonal antibody and subcellular localization of aquaporin 1 (AQP1) in *Ectropis obliqua* (Lepidoptera: Geometridae)  
LI Liang-De, WANG Ding-Feng, LIU Feng-Jing, LI Hui-Ling, ZHANG Hui, WU Guang-Yuan
- 392 Cloning and spatiotemporal and temperature-induced expression profiling of diapause bioclock protein TIME-EA4 gene in the rice stem borer, *Chilo suppressalis* (Lepidoptera: Pyralidae)  
LU Yan-Hui, ZHAO Yan-Yan, ZHANG Fa-Cheng, ZHENG Xu-Song, ZHU Ping-Yang, LU Zhong-Xian
- 402 Cloning and expression profiling of heat shock protein DaHSP23 gene in the winter and summer diapause pupae of the onion maggot, *Delia antiqua* (Diptera: Anthomyiidae) (In English)  
SI Feng-Ling, HE Zheng-Bo, CHEN Bin
- 411 Cloning and expression profiling of heat shock protein gene *PcHsp90* in the citrus red mite, *Panonychus citri* (Acari: Tetranychidae)  
YANG Li-Hong, DOU Wei, JIANG Hong-Bo, NIU Jin-Zhi, DING Tian-Bo, WANG Jin-Jun
- 421 Bioinformatic analysis of microsatellites in the tea green leafhopper, *Empoasca vitis* (Hemiptera: Cicadellidae)  
LI Qian, CHEN Xue-Xin, HAN Bao-Yu
- 427 Identification and selection of valid reference genes for assaying gene expression in the chemosensory tissues of *Monochamus alternatus* (Coleoptera: Cerambycidae) by RT-qPCR  
FENG Bo, GUO Qian-Shuang, MAO Bi-Peng, DU Yong-Jun
- 438 A comparative study of embryonic development between gamogenesis and parthenogenesis in two *Reticulitermes* termites (Isoptera: Rhinotermitidae)  
TAN Yan-Ling, DANG Yu-Lei, ZHANG Hong-Gui, GUO Xiao-Hui, YAN Xing-Rong, SU Xiao-Hong, XING Lian-Xi
- 446 Anatomical structure of the central nervous system of *Apolygus lucorum* (Hemiptera: Miridae)  
XIE Gui-Ying, ZHAO Xin-Cheng, GUO Pei, CHEN Qiu-Yan, WU Guo-Liang, LI Guo-Ping, FENG Hong-Qiang
- 481 Combination of Gal80<sup>ts</sup> and Gal4 flexibly manipulate the expression levels of UAS transgenes in *Drosophila melanogaster*  
LI Kai-Xia, Ma En-Bo, ZHANG Jian-Zhen, ZHAO Yi-Dan, ZHANG Xu-Bo
- 489 A peptidoglycan recognition protein (PxPGRP-SA) regulating the expression of antimicrobial peptides in *Plutella xylostella* (Lepidoptera: Plutellidae)  
ZHENG Zhi-Hua, XU Xiao-Xia, YU Jing, GAO Yan-Fu, ZHANG Yu-Qing, OUYANG Li-Na, JIN Feng-Liang
- 500 Effects of different levels of leucine on the colony population and worker development of *Apis mellifera ligustica* in breeding season  
DAI Rong-Guo, CAO Lan, WANG Rui-Sheng, CHENG Shang, GAO Li-Jiao, LUO Wen-Hua, REN Qin, JI Cong-Hui, XIE Hua, LIU Jia-Lin
- 509 Effects of starvation stress on the physiological characteristics of *Melanotus caudex* (Coleoptera: Elateridae)  
LIU Dan-Dan, CHEN Ai-Duan, LI Ke-Bin, YIN Jiao, ZHANG Shuai, CAO Ya-Zhong
- 516 Response of the discontinuous gas exchange cycle (DGC) duration in *Calliptamus italicus* (Orthoptera: Acrididae) to high temperature stress  
WANG Dong-Mei, LI Shuang, ZHANG Yong-Jun, Roman JASHENKO, JI Rong

- 523 Morphology and ultrastructure of the spermatheca of *Paracryphala microptera meridionalis* (Orthoptera: Arcypterinae)  
( In English)  
LI Ke, YANG Yu-Jing, MAO Lei, ZHANG Jin-Hui
- 581 Transcriptomic analysis of the desert beetle *Microdera punctipennis* (Coleoptera: Tenebrionidae) in response to short-term cold stress  
KUerban Tusong, LU Xue-Ying, LIU Xiao-Ning, MA Ji
- 592 Cloning and characterization of an odorant receptor gene *AlucOR40* in *Apolygus lucorum* (Hemiptera: Miridae)  
ZHANG Zhi-Xiang, ZHANG Mei-Ping, WANG Gui-Rong, LIU Yang
- 602 Molecular cloning, characterization and expression analysis of trehalase genes in the rice leaf folder, *Cnaphalocrocis medinalis* (Lepidoptera: Pyralidae)  
TIAN Yu, DU Juan, LI Shang-Wei, LI Jiao, WANG Shuang
- 613 Expression and binding characterization of chemosensory protein CSP16 in the silkworm, *Bombyx mori*  
GUO Xing-Guo, CHEN Ying, XING Qiu-Ting, XING Wan-Jing, HAN Yun-Chao, QIAO Hui-Li
- 622 Identification and characterization of the CPF family of cuticular protein genes in the genome of *Anopheles sinensis* (Diptera: Culicidae)  
LIU Bai-Qi, QIAO Liang, XU Bai-Ying, ZHENG Xue-Ling, CHEN Bin
- 699 Effects of venom of *Chouioia cunea* (Hymenoptera: Eulophidae) on the hemocyte immunity of *Hyphantria cunea* (Lepidoptera: Arctiidae) pupae  
XIN Bei, ZHANG Shao-Bin, LIU Pei-Xuan, ZHENG Ya-Nan
- 707 Effects of kidney bean damaged by *Frankliniella occidentalis* (Thysanoptera: Thripidae) or *Tetranychus urticae* (Acari: Tetranychidae) on the activities of protective and detoxification enzymes in the other subsequent herbivore of both  
ZHI Jun-Rui, TIAN Tian, WEN Juan, LIU Yong
- 716 Molecular cloning, characterization and induced expression analysis of ion channel gene *RSC1* in *Rhopalosiphum padi* (Hemiptera: Aphididae)  
LIN Fang-Fei, ZUO Ya-Yun, ZHAO Qi, DUAN Xin-Le, LI Yu-Ting, CHEN Mao-Hua
- 724 microRNA Novel-31\* up-regulates the expression of hemocytin gene in the silkworm, *Bombyx mori*  
SHI Li-Li, GENG Tao, WU Ping, PAN Zhong-Hua, QIN Guang-Xing, GAO Kun, HOU Cheng-Xiang, GUO Xi-Jie
- 801 Construction of yeast two-hybrid system and its application in screening the interacting proteins of ecdysone receptors in *Spodoptera litura* (Lepidoptera: Noctuidae)  
FAN Lin-Fang, HE Wen-Jing, SU Zhi-Ren, ZHU Jia-Ming, LUO Wei, ZHANG Chun, HUANG, Li-Hua
- 812 Identification and ligand binding characteristics of antennal binding protein PxylOBP31 in the diamondback moth, *Plutella xylostella* (Lepidoptera: Plutellidae)  
QIN Jiang-Mei, CAI Li-Jun, ZHENG Li-Shuang, CHENG Xiao-Juan, YOU Min-Sheng
- 823 Analysis of the transcriptome and olfaction-related genes of *Conopomorpha sinensis* Bradley (Lepidoptera: Gracilariidae)  
MENG Xiang, HU Jun-Jie, LIU Hui, OUYANG Ge-Cheng, GUO Ming-Fang
- 831 Anatomical structure of the brain of larval *Ectopis obliqua* (Lepidoptera: Geometridae)  
XIE Gui-Ying, CHEN Jun-Hua, TANG Qing-Bo, YIN Jian, ZHAO Xin-Cheng
- 917 Effects of fluctuating temperature on the reproduction and metabolism of primary energy substances in *Mythimna separata* (Lepidoptera: Noctuidae)  
WANG Juan, LI Bo-Liao, WU Jun-Xiang, XU Xiang-Li
- 925 Molecular cloning, sequence analysis and expression profiling of vitellogenin receptor gene in the green rice leafhopper, *Nephotettix cincticeps* (Hemiptera: Cicadellidae)  
CHEN Li-Peng, DU Yu-Ping, FANG Qi, YAO Hong-Wei, YE Gong-Yin
- 938 Changes in the expression of trehalose-6-phosphate synthase gene in *Antheraea pernyi* (Lepidoptera: Saturniidae) during pupal diapause termination  
HUANG Ling, SUN Liang-Zhen, WANG Yong, RU Yu-Tao, Muhammad IRFAN, JIANG Yi-Ren, SHI Sheng-Lin, YANG Rui-Sheng, LI Xi-Sheng, QIN Li

- 948 cDNA cloning, expression analysis and subcellular localization of ubiquitin-like post modification protein NEDD8 in the silkworm, *Bombyx mori*  
YU Jie, XU Li, SHEN Zhong-Yuan, TANG Xu-Dong
  - 1033 Location and expression of AChE in apoptotic midgut cells of *Nilaparvata lugens* (Hemiptera: Delphacidae) induced by host rice resistance  
WANG Si-Qi, CHEN Jun, ZHANG Juan-Juan, YANG Zhi-Fan
  - 1043 Regulation of the expression of fibroin light chain gene *BmFib-L* by bmo-miR-375-3p in *Bombyx mori*  
FAN Yang-Yang, QIAN Ping, SHEN Xing-Jia, WANG Xin, JIANG Tao, TANG Shun-Ming
  - 1050 Cloning and expression analysis of cytochrome *CYP9E2* gene in the Chinese honeybee, *Apis cerana cerana*  
JIANG Wu-Jun, HE Xu-Jiang, WANG Zi-Long, YAN Wei-Yu, ZENG Zhi-Jiang, WU Xiao-Bo
  - 1058 Identification, characteristics and distribution of microsatellites in the whole genome of *Anopheles sinensis* (Diptera: Culicidae)  
WANG Xiao-Ting, ZHANG Yu-Juan, HE Xiu, MEI Ting, CHEN Bin
  - 1069 Effects of protease inhibitors on the activities of midgut proteases of larval *Grapholitha molesta* (Lepidoptera: Tortricidae)  
ZHAO Ai-Ping, SUN Cong, ZHAN En-Ling, WU Jun-Xiang, LI Yi-Ping
  - 1079 Cell proliferation and programmed cell death in the hypopharyngeal gland of *Apis cerana cerana* (Hymenoptera: Apidae) workers during postembryonic development  
LI Zhao-Ying, YU Hong-Mei, SUN Yan, SUN Jing
  - 1291 Cold tolerance and changes in contents of biochemical substances in different developmental stages of *Athetis dissimilis* (Lepidoptera: Noctuidae)  
GUO Ting-Ting, YU Zhi-Hao, MEN Xing-Yuan, YU Yi, ZHENG Chang-Ying, SUN Ting-Lin, ZHANG Si-Cong, LI Li-Li
  - 1298 Effects of elevated CO<sub>2</sub> concentration on nutrient contents and digestive enzyme activities in two color morphs of the pea aphid, *Acyrtosiphon pisum* (Hemiptera: Aphididae)  
LI Run-Hong, LIU Chang-Zhong
  - 1308 Reproductive damage and oxidative stress caused by fluoride in the silkworm, *Bombyx mori*  
TANG Wen-Chao, XIAO Yuan-Yuan, YANG Cheng-Fei, GUO Dong-Dong, ZHU Yong
  - 1317 Analysis of apoptosis and autophagy in wing discs of the silkworm, *Bombyx mori*  
LIU Xue-Shu, HU Qi-Hao, ZHENG Si-Chun, FENG Qi-Li, DENG Hui-Min
  - 1325 Molecular mechanisms regulating the binding capacity of juvenile hormone response region (JHRR) to nuclear proteins in *Drosophila melanogaster*  
HE Qian-Yu, ZHANG Yuan-Xi
  - 1332 Molecular cloning, sequence analysis and prokaryotic expression of the SRP9 gene in the Chinese honeybee, *Apis cerana cerana* (Hymenoptera: Apidae)  
WU Peng-Jie, JIN Hong-Yan, XU Jin, WU Jiang-Li, LI Yu-Shi, GUO Yue-Qin, YAO Jun, XU Shu-Fa, WU Jie
  - 1340 Observation of the sensilla on female adult antenna and larval head of *Agrotis ypsilon* (Lepidoptera: Noctuidae) with scanning electron microscope  
XIANG Yu-Yong, KONG Dan-Dan, LIU Tong-Xian, ZHANG Shi-Ze
- ❖ **Pathology**
- 192 Changes in physiological indices of *Antheraea pernyi* (Lepidoptera: Saturniidae) pupae induced by gram-positive bacteria *Bacillus thuringiensis* and gram-negative bacteria *Escherichia coli*  
FU Ying-Ying, MA Yu-Kun, REN Shu-Wen, YANG Li-Jun, LIU Chun-Guang, FU Hai-Yan, HOU Yue-Ying, YANG Feng-Shan
  - 200 Analysis of the bacterial diversity in the intestine of larval *Procecidochares utilis* (Diptera: Trypetidae) based on 16S rDNA gene sequence  
ZHANG Mou, YANG Pu, ZHU Jia-Ying, YUAN Yuan, GUI Fu-Rong, GAO Xi, WU Guo-Xing

- 292 Change in the diversity of bacterial community in larval midguts of the striped stem borer, *Chilo suppressalis* (Lepidoptera: Crambidae), after treatment with *Bacillus thuringiensis* insecticidal proteins  
LI Zhen, HAN Lan-Zhi, LIU Yu-Di, HOU Mao-Lin
- 456 Phenotypic fingerprints of bacterium *Erwinia persicina* from larval gut of the diamondback moth, *Plutella xylostella* (Lepidoptera: Plutellidae) ( *In English*)  
LI Wen-Hong, JIN Dao-Chao, LI Feng-Liang, JIN Jian-Xue, CHENG Ying
- 464 Temperature regulates the reproduction mode of *Trichogramma embryophagum* (Hymenoptera: Trichogrammatidae) by influencing the titer of endosymbiont *Wolbachia*  
CHEN Xi, WANG Li-Yan, YANG Zhi-Qiang, ZHAO Chang-Jiang, HE Lin, ZHANG Hai-Yan
- 530 *Clostridium perfringens* promotes the growth and development of *Drosophila melanogaster*  
LIU Wei, LI Yu-Juan, LIU Xiao-Liang, ZHUO Ping, YAO Hong
- 632 Seasonal characteristics of gut bacterial communities associated with carpenter ant *Camponotus japonicus* (Hymenoptera: Formicidae) ( *In English*)  
XU Yang, NAN Xiao-Ning, WEI Cong, HE Hong
- 956 Transcriptome analysis of immune responses of *Plutella xylostella* (Lepidoptera: Plutellidae) infected by the entomopathogenic fungus *Isaria fumosorosea*  
LEI Yan-Yuan, HE Yu-Rong, XIE Mei-Qiong, LÜ Li-Hua, GU Jia-Rui
- 965 Analysis of the bacterial community structure and diversity in the intestine of *Cnaphalocrocis medinalis* (Lepidoptera: Pyralidae)  
LIU Xiao-Gai, YANG Ya-Jun, LIAO Qiu-Ju, XU Hong-Xing, LIU Ying-Hong, LU Zhong-Xian
- 1086 Analysis of the diversity of microorganisms in the wax secreted by the Chinese white wax scale insect, *Ericerus pela* (Chavannes) (Hemiptera: Coccidae)  
WANG Xue-Qing, YU Shu-Hui, SUN Tao, ZHAO Zun-Ling, CHEN Xiao-Ming, YANG Pu
- ❖ **Toxicology and Resistance**
- 47 Bioactivities of rosemary and zanthoxylum oils against *Tetranychus cinnabarinus* (Acari: Tetranychidae)  
CHENG Zuo-Hui, LIU Yao-Hua, MA Xin-Yao, SONG Bing-Ze, LI Rui, LI Sheng-Cai
- 301 Inhibitory effects of castanospermine on soluble trehalase from the midgut tissues of *Helicoverpa armigera* (Lepidoptera: Noctuidae)  
YU Cai-Hong, AI Dong, LIANG Xiao-He, WANG Zhen-Bo, GUO Jian-Jun, JIANG Hui, LIN Rong-Hua
- 538 Biological effectiveness of extracts from *Vitex negundo* against *Aphis gossypii* (Homoptera: Aphididae)  
JIANG En-Shun, ZHU Guo-Dong, WANG Jiang-Yong
- 641 Fumigation activities of three essential oils against adult *Musca domestica* (Diptera: Muscidae)  
ZHANG Jun-Tian, XIONG Guo-Hong, HE Jian-Guo, XU Ying, WEI Li-Xiu, PENG Ying-Hui
- 732 Fumigation and repellent activities of the optical isomers of carvone and menthol against *Culex pipiens pallens* (Diptera: Culicidae)  
FU Lei-Lei, LI Shuang-Yang, HE Jun, MA Zhi-Qing, ZHANG Xing
- 839 Insecticidal activity and identification of the active ingredients of *Clausena lansium* seed extracts against larval *Spodoptera litura* (Lepidoptera: Noctuidae)  
GUO Cheng-Lin, QIN Liu-Yan, WAN Shu-Qing, MA Yue-Feng, QIN Jian-Lin, MA Yong-Lin
- 977 Effects of antisera of cadherin, aminopeptidase N and alkaline phosphatase on the toxicities of Cry1Ac and Cry2Aa in *Helicoverpa armigera* (Lepidoptera: Noctuidae)  
WANG Bing-Jie, YUAN Xiang-Dong, ZHAO Man, LIU Chen, CHEN Lin, LIANG Ge-Mei
- 1093 Inhibition of cellular proliferation and induction of necrosis in Ofh cells of *Ostrinia furnacalis* (Lepidoptera: Pyralidae) by momordicin I and charantin B  
LUO Jian-Feng, LIU Huan, GUO Zi-Jun, WANG Guo-Cai, LING Bing

- 1151 Inhibiting effects of common insecticides on carboxylesterase activity in *Sitobion avenae* and *Rhopalosiphum padi* (Hemiptera: Aphididae) and their synergism to beta-cypermethrin  
LU Yan-Hui, GAO Xi-Wu
- 1159 *In vivo* effects of piperonyl butoxide on the activities of 7-ethoxycoumarin O-deethylase and carboxylesterase in larval *Chilo suppressalis* (Lepidoptera: Pyralidae)  
LI Yang, SHI Xue-Yan, GAO Xi-Wu
- 1166 Differential expression of the detoxification enzyme genes in different developmental stages of the whitefly, *Bemisia tabaci* (Hemiptera: Aleyrodidae)  
YANG Ni-Na, ZHANG You-Jun, YANG Xin, HUANG Da-Ye, LONG Tong, WAN Peng
- 1174 Cloning, sequence analysis and expression levels of the acetylcholinesterase-2 gene in the chlorpyrifos-resistant and susceptible strains of *Apolygus lucorum* (Hemiptera: Miridae)  
ZUO Kai-Ran, KANG Zhao-Kui, YANG Yi-Hua, WU Yi-Dong, WU Shu-Wen
- 1182 Expression of nicotinic acetylcholine receptor gene in *Plutella xylostella* (Lepidoptera: Plutellidae) after long-term exposure to low concentration of spinosad  
YIN Xian-Hui, WU Qing-Jun, ZHANG You-Jun, LONG You-Hua, WU Xiao-Mao, LI Rong-Yu, LI Ming, ZHAO Zan-Wei, WANG Ying
- 1189 Identification and expression profiling of nicotinic acetylcholine receptor  $\alpha 9$  subunit gene in *Bactrocera dorsalis* (Diptera: Tephritidae)  
YUAN Guo-Rui, YANG Wen-Jia, XU Kang-Kang, WANG Jin-Jun
- 1199 Abamectin resistance and expression of resistance-related genes in field populations of *Tetranychus urticae* (Acari: Tetranychidae) in China  
LIU Yi-Cong, WANG Ling, ZHANG You-Jun, XIE Wen, WU Qing-Jun, WANG Shao-Li
- 1206 Resistance of wheat aphids to six insecticides and assessment of their field efficacy  
YU Xiao-Qing, ZHANG Shuai, SONG Shu-E, ZHU Qing-Rong, XIE Chuan-Feng, JI Jian, GAO Xi-Wu
- 1213 Insecticide resistance monitoring in field populations of the white-back planthopper, *Sogatella furcifera* (Hemiptera: Delphacidae) in rice production areas of Hubei Province, central China  
ZHANG Xiao-Lei, LIAO Xun, MAO Kai-Kai, LI Jian-Hong, WAN Hu
- 1222 Resistance monitoring of the field populations of the brown planthopper, *Nilaparvata lugens* (Hemiptera: Delphacidae) to common insecticides in rice production areas of Hubei Province, central China  
ZHANG Xiao-Lei, LIAO Xun, MAO Kai-Kai, WAN Hu, LU Peng, LI Jian-Hong
- 1232 Dynamic changes of resistance to conventional insecticides in the brown planthopper, *Nilaparvata lugens* (Hemiptera: Delphacidae) in the main rice growing regions in Guizhou Province, southwestern China  
LI Rong-Yu, LI Ming, WU Xiao-Mao, HU An-Long, YANG Fan, XU Xue-Ling, HAN Jing-Bo, HU Xian-Feng, YIN Xian-Hui
- 1238 Insecticide resistance monitoring and management demonstration of major insect pests in the main cotton-growing areas of northern China  
ZHANG Shuai, MA Yan, MIN Hong, YU Xiao-Qing, LI Na, RUI Chang-Hui, GAO Xi-Wu
- 1246 Monitoring and mechanisms of imidacloprid resistance in *Aphis gossypii* (Hemiptera: Aphididae) in the main cotton production areas of China  
CUI Li, ZHANG Jing, QI Hao-Liang, WANG Qin-Qin, LU Yan-Hui, RUI Chang-Hui
- 1254 Monitoring of insecticide resistance in *Spodoptera litura* (Lepidoptera: Noctuidae) and the effect of indoxacarb on its detoxification enzymes  
LIU Jia, ZHOU Yong, ZHU Hang, MA Hai-Hao, DENG Xi-Le, ZHOU Xiao-Mao, BAI Lian-Yang
- 1263 Nitrogen fertilizer promotes the resurgence of *Nilaparvata lugens* (Hemiptera: Delphacidae) induced by deltamethrin on Bt rice and non-Bt rice lines  
YANG Ya-Jun, LI Xiang-Dong, XU Hong-Xing, ZHENG Xu-Song, LU Zhong-Xian

## ❖ Ecology and Pest Management

- 55 Effects of the dual stress of UV-B and cadmium on the growth, development and fecundity of *Sitobion avenae* (Hemiptera: Aphididae)  
WANG Ping, DU Yi-Min, YANG Jie, CHE Wen-Yan, GAO Huan-Huan, ZHAO Hui-Yan, HU Zu-Qing, HU Xiang-Shun
- 64 Effects of temperature and photoperiod on predation attributes and development of two *Coccinella* species (Coleoptera: Coccinellidae) (*In English*)  
OMKAR, Bhupendra KUMAR
- 209 Adult body size drives sexual selection mutually in the ladybird, *Menochilus sexmaculatus* (Coleoptera: Coccinellidae) (*In English*)  
Ankita DUKEY, OMKAR, Geetanjali MISHRA
- 219 Feeding amount of American ginseng root by *Schwiebia similis* (Acari: Acaridae) and its reproductive potential  
ZHAO Li-Min, CHEN Hao
- 227 Efficiency of UV-absorbing film in the management of pest insects and its effects on the growth and quality of eggplants  
ZHU Liang, WANG Ze-Hua, GONG Ya-Jun, REN Zhong-Hu, JIN Gui-Hua, CHEN Jin-Cui, WEI Shu-Jun
- 239 Mechanism of population regulation in the mutualism between *Breynia vitis-idaea* (Euphorbiaceae) and *Epicephala vitisidaea* (Lepidoptera, Gracillariidae) (*In English*)  
ZHANG Jing, YIN Yan-Ru, WANG Zhi-Bo, ZHANG Zhen-Guo, HU Bing-Bing, SHI Fu-Chen, LI Hou-Hun
- 309 Effects of temperature on the growth, development and reproduction of *Trabala vishnou gigantina* (Lepidoptera: Lasiocampidae)  
LIU Yong-Hua, YAN Xiong-Fei, WEN Dong-Mei, LU Peng-Fei, ZONG Shi-Xiang, LUO You-Qing
- 316 Influence of host body size on potential reproductive capability of *Sclerodermus guani* (Hymenoptera: Bethyridae)  
ZHOU Bing-Ying, LI Bao-Ping, LIN Fang-Fang, MENG Ling
- 322 Survival and developmental performance of *Meteorus pulchricornis* in intrinsic competition with *Microplitis mediator* within the shared host *Mythimna separata* (Lepidoptera: Noctuidae)  
XU Yu-Hang, ZHOU Jin-Cheng, LI Bao-Ping, MENG Ling
- 328 Selectivity and fitness of the two-spotted spider mite, *Tetranychus urticae* (Acarina: Tetranychidae) on different cultivars and species of eggplant  
JIN Gui-Hua, GONG Ya-Jun, QIAN Zong-Wei, ZHU Liang, WANG Ze-Hua, CHEN Jin-Cui, WEI Shu-Jun
- 546 Effects of LED lights at different wavelengths on the reproductive behaviors of *Bradysia odoriphaga* (Diptera: Sciaridae)  
LI Na, FAN Fan, HAN Hui, PEI Xiao-Ya, LIU Shun, WEI Guo-Shu
- 552 Predatory capability of *Tetrigus lewisi* (Coleoptera: Elateridae) to the Japanese pine sawyer, *Monochamus alternatus* (Coleoptera: Cerambycidae) and the yellow mealworm, *Tenebrio molitor* (Coleoptera: Tenebrionidae) under laboratory conditions  
XIN Yu-Cui, ZHANG Long-Wa, FANG Zhu, LIU Zhu-Dong
- 560 Intraguild predation and cannibalism in the phytoseiid mites *Euseius utilis* and *Neoseiulus barkeri* (Acari: Phytoseiidae)  
GUO Jian-Han, MENG Rui-Xia, ZHANG Dong-Xu, YIN Yun-Fei, JIA Yong-Hong, LIU Wen-Ming
- 647 Effects of temperature on the development and reproduction of *Orius minutus* (Hemiptera: Anthracoridae)  
DING Yao, YANG Qun-Fang, LI Qing, JIANG Chun-Xian, WANG Hai-Jian
- 654 Age-stage two-sex life tables of *Spodoptera litura* (Lepidoptera: Noctuidae) at different temperatures  
HAO Qiang, HUANG Qian, LIANG Wei-Bo, GONG Chang-Wei, WANG Xue-Gui
- 663 A simplified recording method for insect life table studies: a case study based on *Bemisia tabaci* (Hemiptera: Aleyrodidae) data  
ZHENG Xiao-Min, QI Xin, CHU Dong

- 669 Biological characteristics of *Epicephala ancylopa* (Lepidoptera: Gracillariidae) on host *Glochidion* sp. (Phyllanthaceae) and the compositional analysis of its floral scent  
ZHANG Zhen-Guo, TENG Kai-Jian, LI Hou-Hun
- 739 Effects of temperature on the development and reproduction of *Acanthoscelides obtectus* (Coleoptera: Bruchidae)  
YAO Jie, DAI Ren-Huai, DAI Chuan-Yong, YANG Hong
- 846 Effects of applied potassium levels on alfalfa nutrients and resistance to thrips (Thysanoptera: Thripidae)  
ZHANG Xiao-Yan, SHI Shang-Li, LI Xiao-Long, LI Ya-Juan, HU Gui-Xin
- 854 Effects of *Apolygus lucorum* (Hemiptera: Miridae) infestation on photosynthesis and chlorophyll fluorescence of jujube leaves  
LI Qing-Liang, TAN Wei, LI Jie, LI Xia-Ming, HUANG Jun-Bao, PANG Chuan-Ming, ZHAO Long-Long
- 865 Effects of temperature on the development and reproduction of *Athetis dissimilis* (Lepidoptera: Noctuidae)  
GUO Ting-Ting, MEN Xing-Yuan, YU Yi, CHEN Hao, ZHOU Xian-Hong, ZHUANG Qian-Ying, WANG Zhen-Ying, LI Li-Li
- 985 Effects of pupal weight on the fecundity and longevity of adults and the larval development of the next generation in *Grapholitha molesta* (Lepidoptera: Tortricidae)  
YU Qin, WANG Fang, ZHANG Run-Xiang, GUO Gui-Ming, FAN Ren-Jun, HAO Chi
- 991 Effects of brief exposure to high temperature in the larval stage on the survival and fecundity of *Athetis lepigone* (Lepidoptera: Noctuidae)  
LIANG Fei-Fei, WANG Zhen-Ying, HE Kang-Lai, ZHANG Tian-Tao, BAI Shu-Xiong
- 997 Attractiveness of jasmonic acid-treated *Morus alba* branches to *Aprostocetus prolixus* (Hymenoptera: Eulophidae) and analysis of their volatile compounds  
WANG Wei, LI Ji-Quan, WANG Shu-Xiang, ZHANG Jing, DONG Xin, TANG Zhe, TIAN Hong-Yu
- 1103 Effects of varied photoperiods on the mating and oviposition of *Brithys crini* (Lepidoptera: Noctuidae) adults  
QIU Xiao-Fang, XIE Jian-Kun, WU Li-Ping, YU Qin, ZHANG Meng-Meng, WANG Guang-Yao, XU Shao-Hui, TU Xiao-Yun
- 1115 Locomotive behavior of *Henosepilachna vigintioctopunctata* (Coleoptera: Coccinellidae) adults moving on ceiling substrata  
HUA Deng-Ke, GUI Lian-You, Gilles BOITEAU, LUO Jie
- 1123 Interactions of *Camellia meiocarpa*, *Curculio chinensis* (Coleoptera: Curculionidae) and a rodent (Rodentia: Muridae) in oil tea (*Camellia meiocarpa*) farm in Yiyang, Hunan, South Central China  
LI Zhi-Wen, SUN Han-Song
- 1348 Syringic acid enhances the lethal and sublethal effects of LdNPV against the gypsy moth, *Lymantria dispar* (Lepidoptera: Lymantriidea)  
ZHANG Bo-Bo, SHAO Dong-Hua, FENG Shu-Jun, MYAGMAR Tserennyam, DUAN Li-Qing
- 1354 Control efficacy of ozone water against the chive gnat, *Bradysia odoriphaga* (Diptera: Sciaridae) and its influences on the growth and seed germination of Chinese chives  
SHI Cai-Hua, HU Jing-Rong, XU Yue-Qiang, YANG Yu-Ting, CHENG Jia-Xu, ZHANG You-Jun
- 1363 Extreme climate has become an important factor causing the termination of outbreak periods of *Loxostege sticticalis* (Lepidoptera: Pyralidae) in China  
CHEN Xiao, JIANG Yu-Ying, MENG Zheng-Ping, CHEN Kuo, KANG Ai-Guo, LI Chun-Min, ZHAI Bao-Ping
- 1376 Optical remote detection of flying agricultural pest insects using dark-field reflectance measurement (*In English*)  
ZHU Shi-Ming, LI Yi-Yun, GAO Li-Na, LI Tian-Qi, ZHAO Guang-Yu, Svanberg SUNE, LU Chao-Hui, HU Jian-Dong, HUANG Jian-Rong, FENG Hong-Qiang

## ❖ Evolution and Systematics

- 77 Phylogenetic relationship within and between three major subfamilies of the Chinese lycaenids (Lepidoptera: Lycaenidae) based on mitochondrial *COI* and *Cytb* gene sequences  
XIA Xue-Qin, CHEN Xiao, XIA Chen-Chen, SHI Qing-Hui, HAO Jia-Sheng

- 85 Observation on the ultrastructure of four dominant *Dermacentor* species (Acari: Ixodidae) in Xinjiang, northwestern China  
WU Hui, SI Qing, ZHU Yu-Tao, SONG Rui-Qi, BAYIN Chahan
- 337 Population genetic analysis of *Apis cerana cerana* from the Qinling-Daba Mountain Areas based on microsatellite DNA  
GUO Hui-Ping, ZHOU Shu-Jing, ZHU Xiang-Jie, XU Xin-Jian, YU Ying-Long, YANG Kai-Jie, CHEN Dao-Yin, ZHOU Bing-Feng
- 346 A survey of the species of aquatic dipteran insects in camel-living environment in Alashan of Inner Mongolia, Northern China  
YU Zhi-Chao, SHAO Guo-Yu, YANG Bo, ZHANG Wei, LI Bin, WANG Rui, YANG Lian-Ru, YANG Xiao-Ye
- 747 Validity of DNA barcoding in identification of *Planococcus minor* (Maskell) (Hemiptera: Pseudococcidae), a potential major invasive alien species to China  
WANG Yu-Sheng, ZHOU Pei, TIAN Hu, WAN Fang-Hao, ZHANG Gui-Fen
- 871 Geometric morphometrics evaluation and adaptive evolution study of scarabaeine metendosternites  
TONG Yi-Jie, YANG Hai-Dong, MA De-Ying, BAI Ming
- 880 Phylogenetic relationship of the genera *Aporia* and *Mesapia* (Lepidoptera: Pieridae) based on *COI* and *EF-1 $\alpha$*  gene sequences  
DING Chang-Ping, ZHANG Ya-Lin
- 888 Application of DNA barcoding identification kit to identify bark beetles of the genus *Dendroctonus* Erichson (Coleoptera: Curculionidae: Scolytinae) (*In English*)  
AN Yu-Lin, YANG Xiao-Jun, YE Jian-Ling, QIAN Lu, XU Mei, WU Yun-Ke
- 1004 Morphology of the immature stages of *Panorpa macrostyla* Hua (Mecoptera: Panorpidae) with notes on its biology  
JIANG Lu, HUA Bao-Zhen
- 1013 Morphological identifiability of Burmese amber inclusions under X-rays  
GUO Ming-Xia, YANG Hai-Dong, LI Gang, TONG Yi-Jie, LI Sha, LU Yuan-Yuan, SHI Ai-Min, WANG Bo, ZHANG Wei-Wei, BAI Ming
- 1133 Ultrastructure of larval compound eyes of *Dicerapanorpa magna* (Mecoptera: Panorpidae) and its implications for the evolution of stemmata of holometabolous larvae  
CHEN Qing-Xiao, HUA Bao-Zhen
- 1386 Morphological and genetic diversity of the Chinese honeybee, *Apis cerana cerana* (Hymenoptera: Apidae) in Chongqing, southwestern China  
GU Ying, BIN Xian-Li, LIU Lu, ZHOU Jun, MA Zhen-Gang, TAN Hong-Wei, ZHOU Ze-Yang, XU Jin-Shan

## REVIEW ARTICLES

- 93 Genetic hierarchies of somatic sex determination in insects  
DUAN Jian-Ping, MENG Xian-Xin, LI Ying, YAO Lun-Guang, KAN Yun-Chao, XIA Qing-You
- 102 Mechanisms of aging in *Drosophila melanogaster*  
ZHANG Chun-Hong, ZHANG Min-Jing, JIAO Wen-Juan, ZHU Qing-Zi, ZHU Zeng-Rong
- 353 Research progress in circadian clock genes in insects  
REN Shuang, WEI Hui-Min, HAO You-Jin, CHEN Bin
- 472 Tracking the trophic relationship between herbivorous insects and host plants by DNA-based technology  
WANG Qian, BAO Wei-Fang, ZENG Juan, YANG Yi-Zhong, LU Yan-Hui
- 682 dsRNA delivery methods for RNA interference in insects  
LIU Ji-Sheng, ZHU Wen-Hui, LIAO Wen-Li, BU Xiao-Ling, JIANG Wan-Yi
- 759 Progress in functions and underlying signal transduction mechanisms of neuropeptides and their receptors in the silkworm *Bombyx mori*  
LI Xiao-Tong, SHI Lian-Gen
- 767 RAD-seq and its application in entomological research  
WEI Shu-Jun, LI Bing-Yan, CAO Li-Jun, ZHU Jia-Ying

- 775 Synergistic effects of *Varroa destructor* and *Deformed wing virus* on honey bee health  
LIN Zhe-Guang, QIN Yao, LI Li, WANG Shuai, ZHENG Huo-Qing, HU Fu-Liang
- 896 Basic scientific questions and molecular biology techniques in entomology  
ZHAO Xiao-Fan
- 906 Research advances in carbohydrate and lipid metabolism in insects  
WEI Qi, SU Jian-Ya
- 1021 Current research on the resurgence, biology and control of bed bugs  
WANG Lei, WANG Chang-Lu, XU Yi-Juan, ZENG Ling
- 1143 Progress in the integrated application of *Chrysomya megacephala* (Diptera: Calliphoridae)  
WANG Xiao-Yun, LI Kui, ZHU Fen, LEI Chao-Liang
- 1272 Long noncoding RNAs (lncRNAs) and their research advances in entomology  
ZHU Bin, LIANG Pei, GAO Xi-Wu

## SHORT COMMUNICATIONS

- 111 Evaluation of *Beauveria bassiana* isolates as potential agents for control of *Hyphantria cunea* (Lepidoptera: Arctiidae)  
ZHANG Long-Wa, KANG Ke, LIU Yu-Jun, ZHANG Jing, SUN Long, ZHAN Cheng, HUANG Chang-Chun, JIANG Li-Ya, YE Kai-Yun, DING De-Gui
- 568 Chlorogenic acid enhances the virulence of *Lymantria dispar* nucleopolyhydrovirus (LdNPV)  
LIU Hai-Jing, DUAN Li-Qing, LI Hai-Ping, FENG Shu-Jun, ZHANG Bo-Bo
- 573 Morphological and biological observations of the black pine borer *Phaenops yin* (Coleoptera: Buprestidae), a potential severe pest of *Pinus tabulaeformis* in Beijing  
CAO Liang-Ming, WANG Xiao-Yi, ZHANG Yong-An
- 692 Rapid detection of *Crithidia bombi* (Kinetoplastida: Trypanosomatidae) by using PCR technique  
ZHANG Ti-Yin, LIU Bei, ZHENG Teng, BAI Quan-Yang, TIAN Guo-Ning, WANG Wu-Jun, ZHANG Zhi-Deng, YU Shi-Yu
- 785 Evaluation of varietal resistance of commercial sugarcane varieties to stalk borers, *Sesamia* spp. (Lepidoptera: Noctuidae), under field conditions (*In English*)  
Amin NIKPAY
- 791 Relationship between population dynamics and gall development of the gall aphid *Kaburagia rhusicola* (Hemiptera: Aphididae)  
ZHA Yu-Ping, YANG Zi-Xiang, CHEN Jing-Yuan, CAI San-Shan
- 797 Phototaxis of *Sitodiplosis mosellana* (Diptera: Cecidomyiidae) adults to linearly polarized light  
JIANG Yue-Li, LI Tong, GONG Zhong-Jun, DUAN Yun, MIAO Jin, WU Yu-Qing
- 1282 Investigation and analysis of the current status of pesticide application in winter melon and vegetable pest control in Hainan Province, southern China  
LIN Zhu-Feng, JI Xun-Cong, PAN Fei, LIANG Yan-Po, XIAO Tong-Bin, XIE Sheng-Hua
- 1395 Silence efficiency of mRNA and protein expression of *Knickkopf* in *Locusta migratoria* (Orthoptera: Acrididae) by dsRNA injection  
YU Rong-Rong, DING Guo-Wei, YANG Mei-Ling, MA En-Bo, ZHANG Jian-Zhen